Rec'd PCT/PTO 09 JUN 2005

10/538194

collected by the pool cleaner. Neither the turbine nor the oscillation type of pool cleaner presents a particular advantage in collecting large objects. REPLACED BY ART 34 AMDT

STATEMENT OF INVENTION

It is therefore an object of the present invention to provide a pool cleaner that is not reliant upon a high velocity head of inlet water flow in order to function effectively.

Therefore, the invention provides a rotor assembly for a self propelling pool cleaner including a housing having a water inlet orifice and a water outlet orifice, a rotor within the housing including a plurality of vanes defining a plurality of spaces between adjacent vanes each vane having pressure sealing means forming a pressure seal between adjacent spacers when said pressure sealing means is in contact with an internal wall of the housing wherein a negative static water pressure applied at the outlet orifice leads to a differential water pressure between two adjacent spaces causing rotation of the rotor.

As defined in *Engineering Hydraulics* by Rouse (Wylie 1950), an impulse turbine is defined as a system which converts velocity head to mechanical energy through impacting a rotor or impeller with a high velocity jet "... thereby giving up its kinetic energy to the ..." rotor (page 939). The turbine type pool cleaner functions in precisely the same way and is correctly identified as a turbine in that mechanical energy to propel the cleaner is derived from the kinetic energy of the high velocity inlet water flow.

The present invention differs markedly in that it is analogous to a hydraulic motor.

The present invention does not rely upon a high velocity head from the inlet but instead creates a pressure differential between adjacent spaces within the housing of the rotor assembly. The differential pressure applies a force against the inlet side of the vane dividing the spaces having the differential pressure driving the rotor in a direction towards the outlet orifice. The mechanical energy required to drive the pool cleaner is imparted by the work done by the pressure differential and so is dependent upon the force applied and consequently the negative static pressure applied by the pool pump and not the kinetic energy derived from the velocity head of the inlet water flow. This system is inherently more efficient in that velocity head can be reduced by shock losses

REPLACED BY ART 34 AMDT

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A rotor assembly for a self propelling pool cleaner including a housing having a water inlet orifice and a water outlet orifice, a rotor within the housing including a plurality of vanes defining a plurality of spaces between adjacent vanes each vane having pressure sealing means forming a pressure seal between adjacent spacers when said pressure sealing means is in contact with an internal wall of the housing wherein a negative static water pressure applied at the outlet orifice leads to a differential water pressure between two adjacent spaces causing rotation of the rotor.

2. The rotor assembly according to claim 1, wherein the vanes include stiffening means to support the vanes against the differential pressure.

3. The rotor assembly according to claim 2, wherein the stiffening means includes a discrete stiffening member for each of said vanes.

4. The rotor assembly according to claim 3, wherein the stiffening member supports the vanes against the differential pressure by supporting at least a portion of the length of the relevant vane.

5. The rotor assembly according to claim 4, wherein the portion of the length is in the range of 50% to 75% of the length of the vane.

6. The rotor assembly according to claim 2 or 3, wherein the stiffening means further includes a means to selectively stiffen the relevant vanes on application of the differential pressure.

7. The rotor assembly according to claim 6, wherein the selective stiffening means includes reshaping of the geometric shape of the vanes so as to increase the flexural stiffness of said vanes.

8. The rotor assembly according to claim 7, wherein the stiffening members include at least one suction channel providing fluid communication between

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adjacent spaces and a deformation face adjacent to the relevant vane such that on application of the differential pressure the vane is drawn towards the at least one suction channel so as to contact the deformation face and so deform the vane and seal the suction channel against further fluid communication wherein said deformed shape of said vane imparts a greater flexural stiffness to the vane as compared to the undeformed shape.

9. The rotor assembly according to any one of the preceding claims wherein the housing is divided into a driving zone defined by an arc formed by the sweep of the vanes between the inlet and the outlet and a return zone defined by an arc defined by the sweep of the vanes from the outlet to the inlet wherein a differential pressure between adjacent spacers is only formable in the driving zone.

10. The rotor assembly according to claim 9, wherein the vanes are adapted to have a maximum stiffness in the driving zone and a minimum stiffness in the return zone, so as to be resiliently flattened in the return zone.

11. The rotor assembly according to claim 10, wherein the distance from an axis of the rotor to an internal wall of the housing is substantially the same as the length of the vanes in the driving zone and substantially less than the length of the vanes in the return zone whereupon the vanes resiliently flatten in the return portion due to contact with the internal wall.

12. The rotor assembly according to any one of the preceding claims wherein the vanes are made from a very flexible visco-elastic material.

13. The rotor assembly according to claim 12, wherein said very flexible visco-elastic material includes silicone, polyurethane and rubber.

14. The rotor assembly according to any one of claims 6 to 13, wherein the vanes are adapted to buckle so as to permit the passage of an object of substantial size from the inlet to the outlet through the driving zone.

15. The rotor assembly according to claim 14, wherein said object has a maximum dimension of at least 50 percent of the length of the vanes.